

Three fingers precision grasping operation of 3D printed multi-fingered hand

ABSTRACT

There is an increasing number of people with traumatic injury related to hand amputations. The amputees experience many problems, especially dealing with activities of daily living (ADLs). Hence, the prosthetic hand is designed to help amputees to perform daily activities. Customized prosthetic hand with high performance is very costly and use heavy DC motors for actuation. This paper presents a low-cost prosthetic hand, which uses a 3D printing technology and simple actuator system. Hand model with three active digits; thumb, index and middle fingers are developed. The hand is controlled by Arduino microcontroller and DC servo motor in pulling tendon performing grasping operation. It was instrumented with FlexiForce sensors to monitor the grasping force formed by each finger. The performance of the hand is tested for the three fingers precision grasping operation using cylindrical object. The data presented is the maximum force for three fingers precision grasping operation using 3D printed hand.

Keyword: 3D printing; Hand; Grasping operation; Grasping force